SHARP

SHARP

SERVICE MANUAL

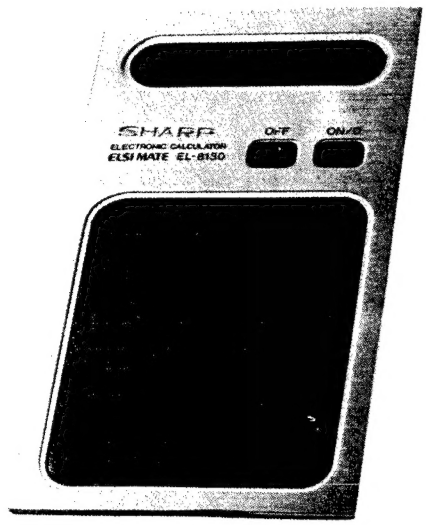
MODEL EL-8130

ELECTRONIC CALCULATOR

SHARP CORPORATION

1. FOREWORD

In addition to the ultra-thin 7 mm calculators which are already having high reputations in the market, the model EL-8130 now made public by Sharp is also a full-fledged 8-digit calculator that is only 5 mm thin. This super-slim calculator is still provided with various functions such audio input verifier and automatic power off circuit, etc.



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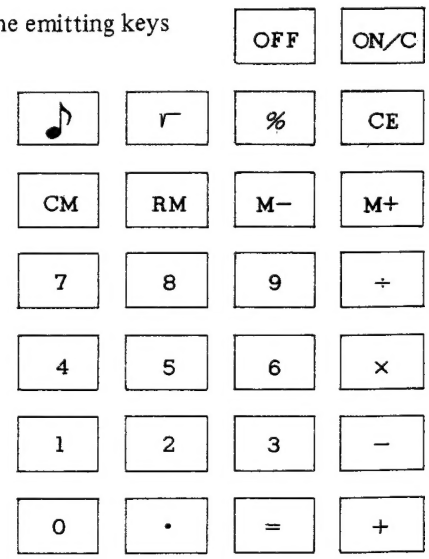
2. SPECIFICATIONS

- Keys' layout

Tone emitting keys



- Display: FEM type liquid crystal display (8 digits for the numeral part, 1 digit for the symbol)
- Operation capacity: 8 digits
- Memory: 1
- Power source: Silver oxide battery (G-10 x 2 or (SR-1130) x 2 usable time 600H. (Please note that only Union Carbide model 389, and Ray-O-Vac model RW49 or equivalent should be used.)
- Dimensions: 68(W) x 4.9(H) x 124(D) mm

3. SERVICING

3-1. Disassembly and reassembly of the set

Being only 5 mm thin, this calculator requires great cares when disassembled and reassembled at the servicing. In particular, pay attention not to give the liquid crystal and the buzzer a strong force.

- Disassembly
  1. Remove the screw located at the center of the bottom cabinet to take out the bottom cabinet. The chassis will then be removed together with the top cabinet.
  2. Pull out the two batteries.
  3. Carefully peel off the black masking sheet which is applied to the chassis.
  4. Carefully peel off the tape (silver color) which is applied to the chassis.
  5. The chassis is being fixed by 13 pawls which are located on the top cabinet. By using a pincettes, straighten each of these pawls, then the chassis, top cabinet, liquid crystal and anisotropic tape will all be independent from each other.
  6. Remove the display spacer from the top cabinet, then the filter will also be removed.

     Note: Different from the above, as for the sets up to 250,000th unit, the display spacer cannot be removed since it is directly fixed to the top cabinet. Refer to "Reasembly 4" described later.
  7. The chassis and PWB are being attached to each other by means of both-side tape which is applied around the keys OFF and ON/C. Holding the chassis by one hand, carefully remove the PWB by another hand.
  8. Remove soldered leads of the PWB (at three portions).
  9. Remove battery terminal.

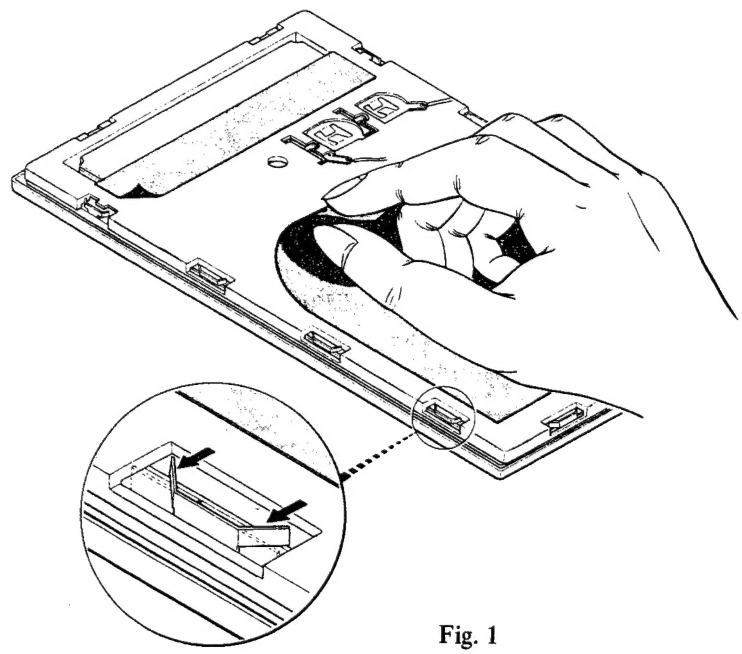


Fig. 1

- Reassembly

For the reassembly, it is so each to take the procedures reverse to those for the disassembly. However, it will reguire the following to be taken in consideration.

1. Leads between the battery terminal and the PWB should be settled as specified in the groove of the chassis.
2. The PWB and liquid crystal should be aligned exactly by means of an anisotropic tape. Take care not to touch their joint by finger nor to soil it with impurities.

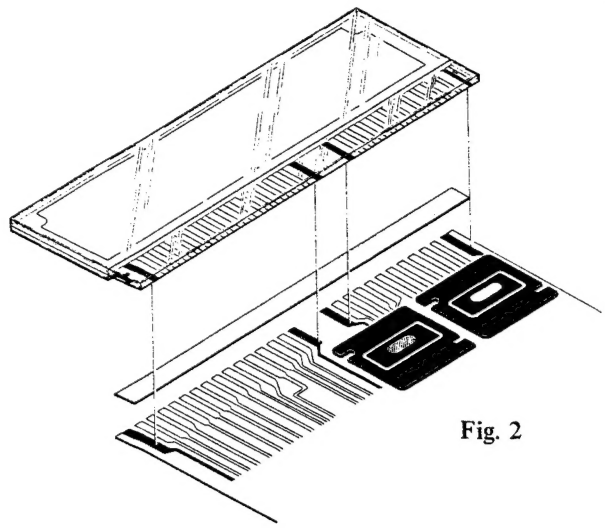


Fig. 2

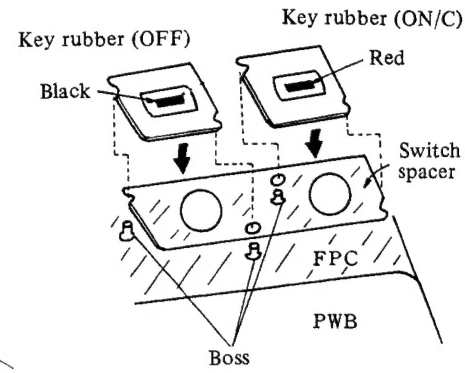
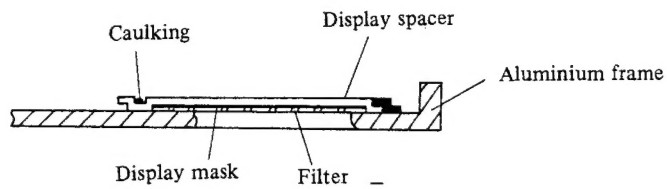


Fig. 3

3. As shown in the (Fig. 3), the key rubber and switch spacer should be set exactly matching the respective bosses of the chassis.
4. Change in the method to attach the display spacer and filter.
   (1) Up to the 250,000th unit



* Since the display spacer is directly caulked to the chassis, it is not possible to replace the filter with a new one.

   (2) After the 250,001st unit

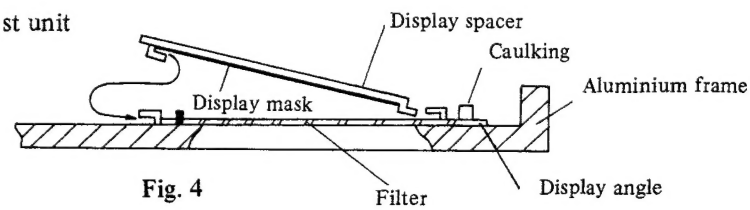


Fig. 4

* With this change, it becomes possible to remove the display spacer.

As for the sets up to 250,000th unit, it can been seen from the above that the display spacer and filter are fixed to the top cabinet and so if you find some trouble in them at the servicing, it is recommended to replace such parts with new ones which are applicable to the sets after 250,001st unit. The Parts List and Guide carry only the new parts. (There is not interchangeability at all among the filter, display mask and display spacer in (1) and those in (2).)

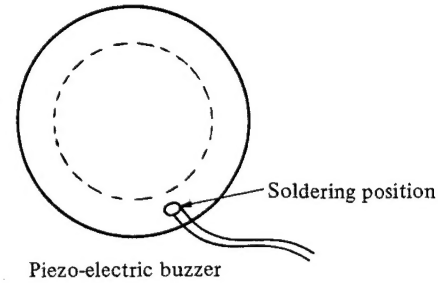
3-2. Cautions on servicing

2-1 Soldering on the piezo-electric buzzer

In this work, be sure to use a low-fusing point solder.

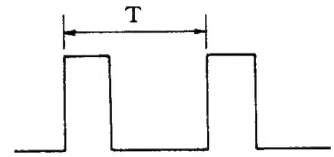
Iron tip temperature: 190° ± 10°X

Soldering time: Less than 3 seconds

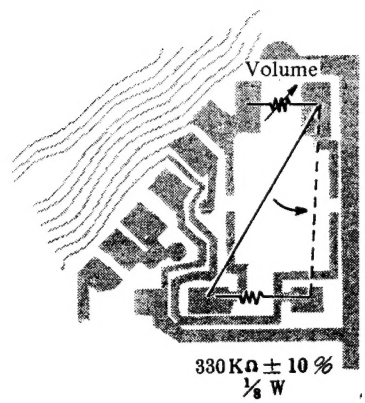


2-2 Control adjustment

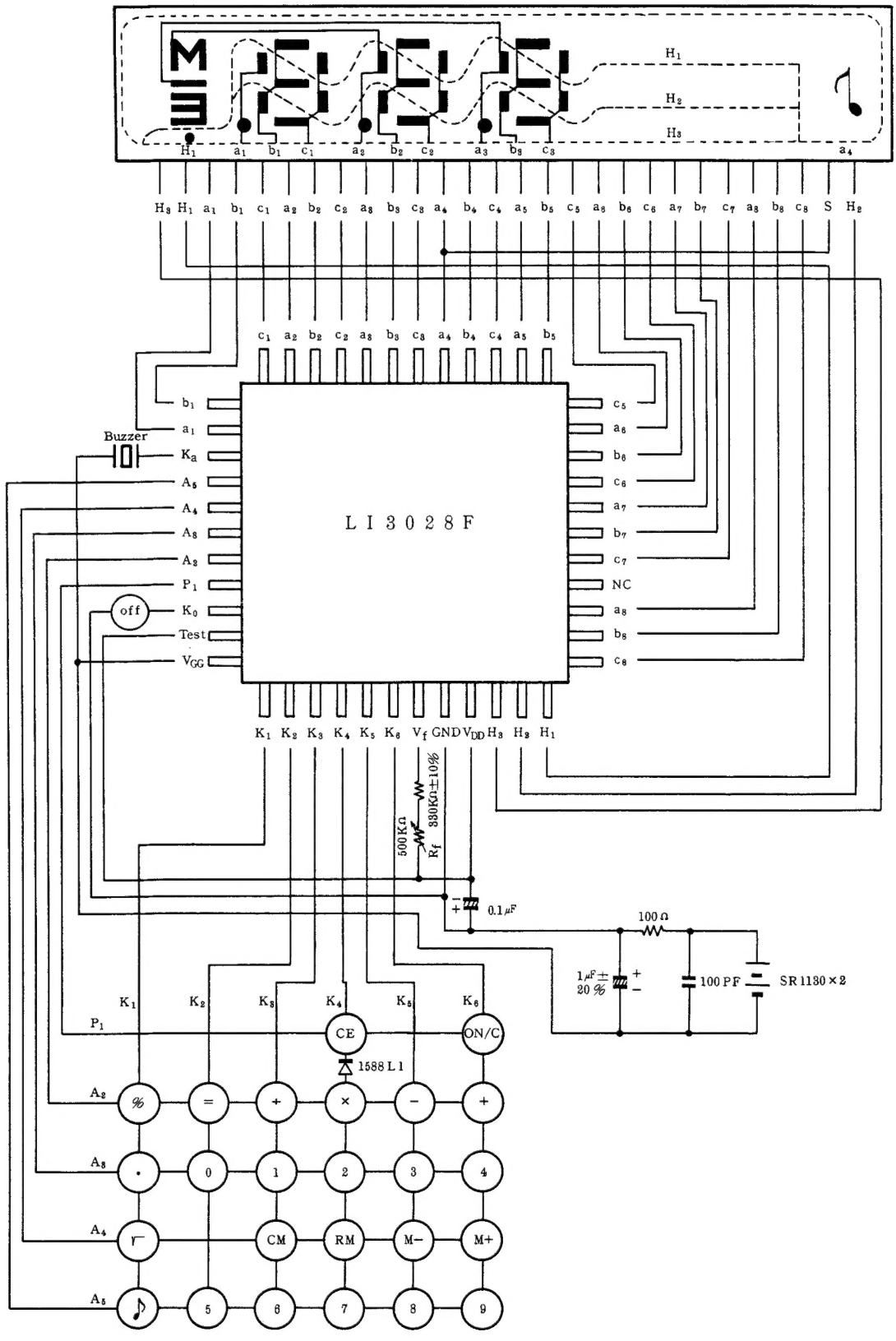
Leving the key ON/C be depressed, keep V_{in} to 3.15 V to make surethat the signal A_2 is within the range of 2.9 ms $\leqq T \leqq$ 3.1 ms. If the above value is not satisfied, adjust it by using the control RVR-M5513QCZZ. Yet, if this adjustment is not statisfactory, change the position of jumper wire to the opposite side of the resistor 330KΩ as shown in the figure herof and again proceed with the adjustment.



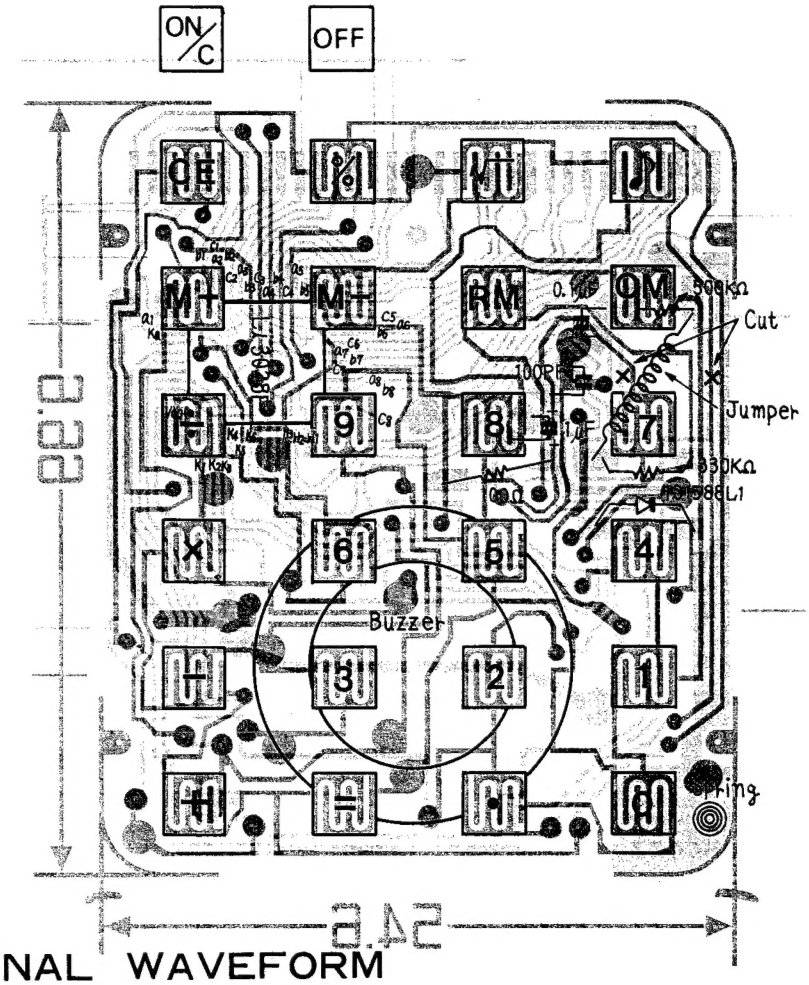
(More simplanize adjustment of above, we may ask you to adjust the Volume to be most nice buzzer sound.)



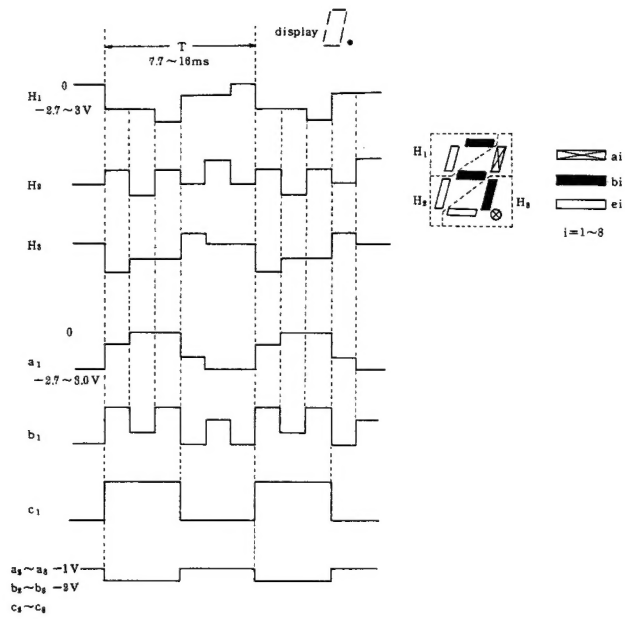
4. CIRCUIT DIAGRAM



5. PARTS & SIGNAL POSITION



6. SIGNAL WAVEFORM



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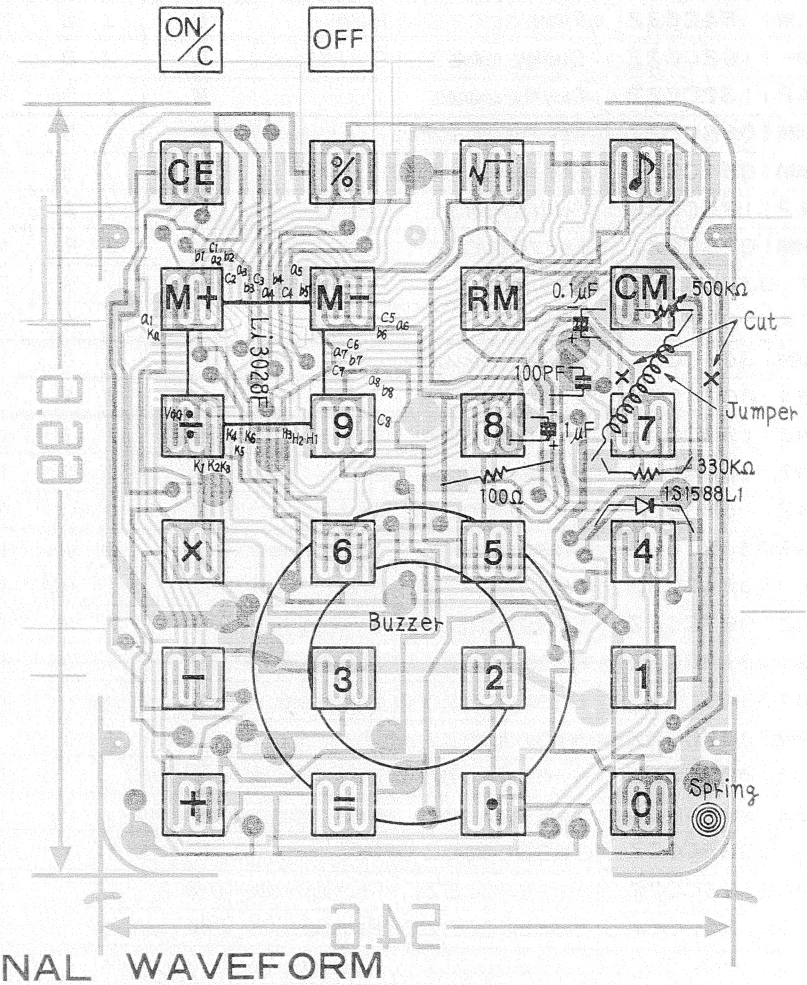

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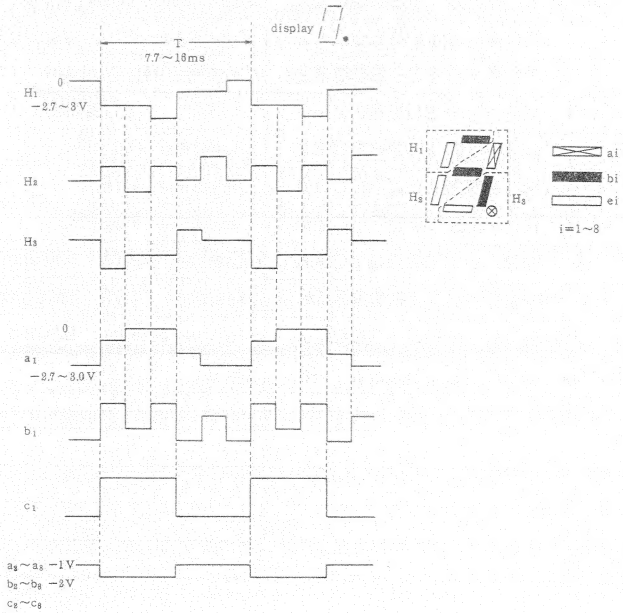

7. PARTS LIST

NO.	PARTS CODE	DESCRIPTION	SC NEW PARTS MARK	JAPAN PRICE RANK	EXPORT PRICE RANK
1	DCABBO337CSZZ	Top cabinet	N	J R	A V
2	PFiLW1154CCZZ	Filter	N	J D	A D
3	PSLD—1102CCZZ	Display mask	N	J B	A B
4	PSPAP1132CCZZ	Display spacer	N	J D	A D
5	PGUMM1086CCZZ	Key rubber (OFF)	N	J D	A E
6	PGUMM1081CCZZ	Key rubber (ON/C)	N	J D	A E
7	PSPAP1125CCZZ	Switch spacer	N	J A	A A
8	PGUMM1079CCZZ	Key rubber	N	J E	A F
9	DUNT—037BCCZZ	LCD cell	N	J S	A W
10	DUNTKO338CSZZ	PWB unit	N	K A	B F
11	PGUMM1091CCZZ	Rubber connector	N	J C	A C
12	PTUBX1002CCZZ	LCD fixing tube	N	J A	A A
13	QTANZ1159CCZZ	Battery terminal A	N	J B	A B
14	QTANZ1158CCZZ	Battery terminal (—)	N	J B	A B
15	QTANZ1157CCZZ	Battery terminal (+)	N	J B	A B
16	DCHSSO339CSZZ	Chassis assy	N	J M	A Q
17	PSHEP1024CCZZ	Sheet	N	J B	A B
18	MSPRC1097CCZZ	Earth spring	N	J A	A A
19	LANGT1213CCZZ	Buzzer angle	N	J B	A B
20	DCABAO340CSZZ	Bottom cabinet (with mylar sheet)	N	J H	A H
21	PPAPM1003CCZZ	Memo paper		J B	A A
22	UBAGZ1083CCZZ	Book type case (Export)	N		A K
	UBAGZ1092CCZZ	Book type case (Japan)	N	J H	
	SPAKC2365CCZZ	Packing case (Japan)	N	J C	
	SPAKC2366CCZZ	Packing case (U. S. A)	N		A C
	SPAKC2434CCZZ	Packing case (Other countries)	N		A C
	TiNSJ1980CCZZ	Instruction book (Japanese)	N	J B	
	TiNSE1981CCZZ	Instruction book (English)	N		A B
	TiNSM1982CCZZ	Instruction book (E, F, G, S)	N		A C
	TGANJ1025CCZZ	Guarantee card (Japan)		J A	
	TLSTS1005CCZZ	Service list (Japan)		J A	
	VHiLi3028F/—1	L. S. i (Li-3028)	N	J W	A Y
	RC—SZ1006CCZZ	Capacitor 0.1μF	N	J E	A F
	RC—SZ1007CCZZ	Capacitor 1μF	N	J E	A F
	RC—KZ1007CCZZ	Capacitor 100PF	N	J B	A B
	VRC—MT2BG101K	Resistor 1/8W 100ohm		J A	A A
	VRC—MT2BG334K	Resistor 1/8W 330Kohm		J A	A A
	RVR—M5513QCZZ	Volume resistor 500Kohm	N	J E	A E
	VHDIS1588L1—1	Diode 1S1588L1		J B	A C

8. PARTS GUIDE